COMMENTS

Guidelines For the Admissibility Of Evidence Generated By Computer For Purposes Of Litigation

This comment examines the application of the Federal Rules of Evidence to the admissibility of evidence that is generated by computer for purposes of litigation. The comment classifies this evidence into three types, and determines for each type the conditions under which it should be admissible or the circumstances that warrant its use as a basis for expert testimony.

INTRODUCTION

The computer age has spawned a number of problems for the legal practitioner.[1] Among these are problems concerning the admissibility of computer-generated evidence.[2] Broadly speaking,

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[1] For a general discussion of the effect of computerization on the legal community, see Bigelow, *The Lawyer's Role in the Computer Age*, 1 RUT. J. COMPUTERS & L. 1 (1970). For a non-technical description of computers and their operation, see Roberts, *A Practitioner's Primer on Computer-Generated Evidence*, 41 U. CHI. L. REV. 254, 256-63 (1974).

[2] Computer-generated evidence is

> any information whose most immediate source prior to its introduction in the courtroom is a computer. It may be introduced in court as printed matter or as oral testimony by a witness who previously read it from a computer printout or an electronic display device attached to a computer. The only unique characteristic of computer-generated evidence is that it once existed as electrical impulses within a computer.

Foreword to *Law and Technology Symposium: Coping with Computer-Generated Evidence in Litigation*, 53 CHI.-KENT L. REV. 545, 545 (1976). Computer-generated evidence has been described more technically as "the result of an

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computer-generated evidence problems cover two areas. The first area concerns the admissibility of business records that are generated by computer in the regular course of business. The second area concerns the admissibility of evidence generated by computer for purposes of litigation (comp-lit evidence).[3]

The evidentiary problems that are associated with computer-generated business records have attracted considerable attention in federal statutes,[4] judicial decisions,[5] and legal commentaries.[6] But legislators and commentators have paid little attention to problems concerning the admissibility of comp-lit evidence.[7] This inattention may poorly serve many legal practitioners who have continued to expand their use of the computer in litigation support. The modern litigator frequently employs comp-lit evidence[8] in the form of summaries of business records,[9] analyses of

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[electronic data processing] program." Singer, *Proposed Changes to the Federal Rules of Evidence as Applied to Computer-Generated Evidence,* 7 RUT. J. COMPUTERS, TECH., & L. 157, 163 (1979).

For general discussions of evidentiary problems in this area, see Younger, *Computer Printouts in Evidence: Ten Objections and How to Overcome Them,* 2 LITIGATION, Fall, 1975, at 28; Singer, *supra* this note.

[3] Other commentators have observed this broad dichotomy between types of computer-generated evidence. *See, e.g.,* Roberts, *supra* note 1, at 255; Singer, *supra* note 2, at 179-80.

[4] *See, e.g.,* FED. R. EVID. 803(6).

[5] *See, e.g.,* Rosenberg v. Collins, 624 F.2d 659 (5th Cir. 1980); United States v. Weatherspoon, 581 F.2d 595 (7th Cir. 1978); United States v. Fendley, 522 F.2d 181 (5th Cir. 1975); United States v. DeGeorgia, 420 F.2d 889 (9th Cir. 1969).

[6] *See, e.g.,* Connery & Levy, *Computer Evidence in Federal Courts,* 84 COM. L.J. 266 (1979); Jacobson, *The Use of Computer Printouts in Commercial Litigation,* 82 COM. L.J. 14 (1977). Roberts, *supra* note 1; Note, *Appropriate Foundation Requirements for Admitting Computer Printouts into Evidence,* 1977 WASH. U.L.Q. 59.

[7] For a brief treatment of evidentiary problems connected with comp-lit evidence, see Jenkins, *Computer-Generated Evidence Specially Prepared for Use at Trial,* 52 CHI.-KENT L. REV. 600 (1976).

[8] This comment classifies comp-lit evidence into three types that have surfaced in reported litigation. *See* notes 9-11 *infra.* However, this classification does not exhaust the types of comp-lit evidence that the litigator might find useful. For a more thorough list, see Jenkins, *supra* note 7, at 601-05.

[9] A computer-generated summary of business records is a condensation that states the content of the records. *See* FED. R. EVID. 1006, set forth in note 53 *infra. See also* Advisory Committee's Note to Rule 1006, 56 F.R.D. 183, 346 (1972) (characterizing a summary as "the only practicable means of making . . . contents available . . . ."). *See generally* Sprowl, *Evaluating the Credibil-*

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business records,[10] and computer simulations.[11]

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ity of Computer-Generated Evidence, 52 CHI.-KENT L. REV. 547, 562-64 (1976).

Computers may be programmed to condense either information that is contained in their data banks or records that are compiled manually. For an illustration of the first method of condensation, see United States v. Russo, 480 F.2d 1228 (6th Cir. 1973) (to show defendant doctors filed fraudulent insurance claims, prosecutor obtained a printout tabulating information concerning defendants' use and billing of a certain medical procedure) *cert. denied,* 414 U.S. 1157 (1974). For illustrations of the second method, see United States v. Kim, 595 F.2d 755 (D.C. Cir. 1979) (to prove defendant had bribed a United States Congressman, prosecutor obtained a printout summarizing defendant's deposit activity in a Korean bank for a specified time period); United States v. Smyth, 556 F.2d 1179 (5th Cir.) (to prove defendant overbilled government on construction contracts, prosecutor obtained a printout tabulating information disclosed by employee labor distribution cards), *cert. denied,* 434 U.S. 862 (1977).

[10] Computer analysis results when input data are fed into the computer and the computer is programmed to produce conclusions about the data by applying a "model," which is a set of operating assumptions. For technical details see Eastin, *The Use of Models in Litigation: Concise or Contrived?,* 52 CHI.-KENT L. REV. 610 (1976); Jenkins, *supra* note 7, at 604; Sprowl, *supra* note 9, at 548-57. For a specific explanation of models and computer modelling, see C. SIPPL, COMPUTER DICTIONARY AND HANDBOOK 194, 481-88 (1966).

United States v. Diogaurdi, 428 F.2d 1033 (2d Cir.), *cert. denied,* 400 U.S. 825 (1970), illustrates the use of computer analysis in litigation. The prosecution charged defendants in a bankruptcy case with fraudulently concealing assets. To prove its case, the prosecution employed a computer expert to determine the date on which the items in defendants' inventory should have been exhausted. As input data, the experts used defendants' previously compiled record of items in inventory. As a model, he used the assumption that items first received into inventory would be the items first sold. The computer, programmed to apply the model to the input data, determined the date on which these inventory items should have been exhausted. *Dioguardi,* 428 F.2d 1033.

The litigator should be careful to distinguish between summaries and analyses, because the two types of evidence present different evidentiary problems. *See* text accompanying notes 34, 35, 38, 40, 57-60 & 75-77 *infra.*

[11] Computers may be programmed to simulate physical events through the use of simulation-models. Simulation-models are sets of assumptions about which events would transpire under some clearly defined set of circumstances. *See generally* R. DORF, COMPUTERS AND MAN 201-54 (1974). The litigator can use simulation-models to predict future physical events or to explain past events. *Id.*

Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111 (2d Cir.), *cert. denied,* 429 U.S. 987 (1976) illustrates the use of computer simulation-models to predict future physical events. Plaintiff alleged breach of a best efforts promise to perfect and market an automotive anti-skid device. To show that the device could be perfected and marketed, the plaintiff's computer experts

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This comment analyzes the major issues concerning the admissibility of comp-lit evidence and offers guidelines for the litigator seeking its admission under the Federal Rules of Evidence. Part I considers problems that are involved in laying a foundation for the introduction of comp-lit evidence. Part II addresses problems that are associated with the evidence's hearsay nature. Part III discusses the extent to which the litigator can circumvent these problems through the use of expert testimony. The comment finally evaluates the state of the law in this area.

I. Foundation Requirements

The litigator who seeks the admission of comp-lit evidence must lay an adequate foundation for it. An adequate foundation includes a proper authentication of the evidence.

A. *Requirements of Authentication*

All evidence must meet the minimum authentication requirements of Federal Rule of Evidence 901(a).[12] Rule 901(b)(9)[13] in-

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used a computer simulation of an automobile that was equipped with a hypothetical anti-skid device performing a series of stops. The results of the computer simulation formed the basis of expert testimony regarding the feasibility of the device's perfection. *Perma Research*, 542 F.2d 111.

Messex v. Louisiana Dep't of Highways, 302 So. 2d 40 (La. App. 1974), illustrates the use of computer simulation-models to explain past events. Plaintiff brought an action for personal injuries sustained in an automobile accident. To recover under the last clear chance doctrine, the plaintiff used a computer study to show that the defendant motorist had possessed a reasonable opportunity to avoid the accident. The computer expert who conducted the study considered the defendant's stated speed of 45 to 50 miles per hour, his skid distance of 45 feet, and a variable range of figures for reaction times, friction ratios, and speeds at impact. By offering an explanation of the accident, the simulation assisted the court in determining whether the defendant had possessed a reasonable opportunity to avoid the accident. *Id.*

[12] Rule 901(a) states: "The requirement of authentication or identification as a condition precedent to admissibility is satisfied by evidence sufficient to support a finding that the matter in question is what its proponent claims." Fed. R. Evid. 901(a).

[13] Rule 901(b)(9) states:

> By way of illustration only, and not by way of limitation, the following are examples of authentication or identification conforming with the requirements of this rule: . . . (9) Process or system. — Evidence describing a process or system used to produce a result and showing that the process or system produces an accurate result.

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dicates how a litigator who seeks to introduce the result of a computer process into evidence may meet the authentication requirements. The litigator may produce evidence that describes the process or system used to reach the result and shows that the process or system produces an accurate result.[14]

1. General Guidelines for Authentication

The Federal Rules of Evidence provide no guidelines for meeting the criteria set forth in Rule 901(b)(9). Further, while courts have admitted comp-lit evidence,[15] no court has expressed guidelines for its authentication.[16] A number of courts, however,

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FED. R. EVID. 901(b)(9).

Computer systems are among the systems expressly contemplated under Rule 901(b)(9). *See* Advisory Committee's Note to 901(b)(9), 56 F.R.D. 183, 335-36 (1972).

[14] Rule 901(b)(9) leaves open the possibility that the litigator may properly authenticate computer-generated evidence by other means. *See* FED. R. EVID. 901(b)(9), set forth in note 13 *supra*. *See also* Advisory Committee's Note to Rule 901(b), 56 F.R.D. 183, 333 (1972). For instance, the litigator may ask the court to take judicial notice of the accuracy of the process or system. *See* Advisory Committee's Note to Rule 901(b)(9), 56 F.R.D. 183, 336 (1972). Judicial notice will often be appropriate when an organization with a long standing record of computerized record-keeping such as the Internal Revenue Service conducts the computer process.

Another alternative to meeting the criteria of Rule 901(b)(9) is the use of self-authenticating documents. *See* FED. R. EVID. 902(4). In United States v. Farris, 517 F.2d 226, 228-29 (7th Cir.), *cert. denied*, 423 U.S. 892 (1975), the court admitted an officially certified computer printout introduced by the Internal Revenue Service as a self-authenticating public record.

[15] *See, e.g.*, Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111 (2d Cir.), *cert. denied*, 429 U.S. 987 (1976); United States v. Dioguardi, 428 F.2d 1033 (2d Cir.), *cert. denied*, 400 U.S. 825 (1970).

[16] To be precise, no court has expressed guidelines for the authentication of computer evidence that is retrieved *and* originally conceived for purposes of litigation. However, some courts have developed authentication guidelines for a particular species of comp-lit evidence that is retrieved for purposes of litigation but originally conceived for business purposes. The litigator can authenticate this type of evidence by showing the input procedures used to supply information to the computer, the tests that were used to assure the accuracy and reliability of both the computer operations and the information that was supplied to the computer, the fact that the information was converted into machine-readable form in the regular course of business, and the fact that the computer automatically retrieved this information in an unaltered state. *See* United States v. Kim, 595 F.2d 755, 762 n.36 (D.C. Cir. 1979); Transport Indem. Co. v. Seib, 178 Neb. 253, 132 N.W.2d 871 (1965). *Cf.* United States v.

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have agreed on a set of requirements for authenticating computer-generated business records.[17] The proponent of comp-lit evidence should follow a modified version of the business records requirements.[18] Thus, the litigator should show first the input procedures that were used to supply information to the computer.[19] Second, the litigator should show the tests that were used to assure the accuracy and reliability of both the computer operations and the information that was supplied to the computer.[20]

Two considerations combine to support the application of these requirements to the authentication of comp-lit evidence.

Scholle, 553 F.2d 1109, 1125 (8th Cir.), *cert. denied,* 434 U.S. 940 (1977); United States v. Russo, 480 F.2d 1228, 1241 (6th Cir. 1973), *cert. denied,* 414 U.S. 1157 (1974); United States v. DeGeorgia, 420 F.2d 889, 893 n.11 (9th Cir. 1969).

However, this comment primarily focuses on computer evidence that is not only retrieved but also conceived for purposes of litigation. This type of comp-lit evidence accords more with an intuitive understanding of evidence generated by computer for purposes of litigation. See, however, notes 63-65 and accompanying text *infra,* for discussion of comp-lit evidence that was originally conceived for business purposes.

[17] The proponent of the evidence must authenticate a computer-generated business record by showing the input procedures used to supply information to the computer, the tests that were used to assure the accuracy and reliability of both the computer operations and the information that was supplied to the computer, and the fact that the computer record was generated and relied upon in the regular course of business. *See, e.g.,* United States v. Weatherspoon, 581 F.2d 595, 598 (7th Cir. 1978); United States v. Fendley, 522 F.2d 181, 187 (5th Cir. 1975); United States v. Russo, 480 F.2d 1228, 1239-41 (6th Cir. 1973), *cert denied,* 414 U.S. 1157 (1974); United States v. DeGeorgia, 420 F.2d 889 (9th Cir. 1969).

[18] The business records requirements are set forth in note 17 *supra.*

[19] Input procedures determine that the input data is accurate, properly authorized, and properly converted into machine readable form. The input procedures also determine access to the program and terminal, and responsibility for the input process. *See* Singer, *supra* note 2, at 165-66. *See generally* E. AWAD, INTRODUCTION TO COMPUTERS IN BUSINESS 41-42 (1977).

Instituting proper input procedures is important. For example, an unauthorized person with access to the program might modify the program to disrupt business operations.

[20] Tests for the accuracy of the computer operations check for "hardware" (mechanical) defects and "software" (programming) defects. *See* Singer, *supra* note 2, at 163-64. Tests for hardware defects check the capacity, capability, and reliability of the equipment. *See* C. SIPPL, *supra* note 10, at 324. Tests for software defects normally involve check systems in which a sample problem with a known answer is run before processing a problem. *Id.*

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First, Rule 901(b)(9) provides criteria for authenticating *any* type of computer-generated evidence.[21] Courts have issued requirements for meeting these criteria when the proffered evidence is a computer-generated business record.[22] Unless these requirements adapt only to business record situations, Rule 901(b)(9) authorizes their application to comp-lit evidence, as well.

Second, the application of the business records requirements need not be limited to situations involving business records. This contention admittedly appears to overlook the requirement that the proponent of business records establish that they were generated and relied upon in the regular course of business.[23] However, satisfaction of this requirement is relevant only to raise a presumption that the proponent has satisfied the two authentication requirements mentioned earlier.[24] Thus, the litiga-

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[21] *See* FED. R. EVID. 901(b)(9), set forth in note 13 *supra*.

[22] *See* note 17 and accompanying text *supra*.

[23] *Id.*

[24] The courts commonly apply a presumption that the proponent has established the first two authentication requirements, *see* text accompanying notes 19 & 20 *supra*, by showing that the computer records were generated in the regular course of business. *See, e.g.*, United States v. Kim, 595 F.2d 755, 761 (D.C. Cir. 1979); United States v. Fendley, 522 F.2d 181, 187 (5th Cir. 1975); Hiram Ricker & Sons v. Students Int'l Meditation Soc'y, 501 F.2d 550, 554 (1st Cir. 1974); United States v. Miller, 500 F.2d 751, 755 (5th Cir. 1974), *rev'd on other grounds*, 425 U.S. 435 (1976); Olympic Ins. Co. v. Harrison, 418 F.2d 669, 670 (5th Cir. 1969). This presumption shifts the burden to the opponent of the comp-lit evidence to show that the first two authentication requirements have not been established.

A minority of courts raise a presumption only of the computer's mechanical accuracy upon a showing that the computer records were generated in the regular course of business. *See* United States v. Scholle, 553 F.2d 1109, 1125 (8th Cir.), *cert. denied*, 434 U.S. 940 (1977); United States v. Russo, 480 F.2d 1228, 1239-40 (6th Cir. 1973), *cert. denied*, 414 U.S. 1157 (1974).

Commentators have criticized the trend of shifting the burden on the ground that the complexity of the computer process does not justify the presumption of reliability that attends manual record-keeping in the regular course of business. *See* Roberts, *supra* note 1, at 279; Singer, *supra* note 2, at 169. In United States v. DeGeorgia, 420 F.2d 889 (9th Cir. 1969) (Ely, J., concurring), Judge Ely criticizes shifting the burden on more philosophical grounds:

> [W]e must be careful to insure that fundamental rights are not surrendered to the calculations of machines. If a machine is to testify against an accused, . . . it is essential that the trial court be convinced of the trustworthiness of the particular records . . . by proof presented by the party seeking to introduce the evidence

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tor can meet the substance of the business records requirements without showing that the proffered evidence is a business record.[25]

In sum, the business records requirements should govern the authentication of comp-lit evidence since the substance of the requirements does not confine their application to situations involving business records. Since the two requirements mentioned earlier[26] express the substance of the business records requirements, these two requirements constitute appropriate guidelines for the authentication of comp-lit evidence.[27]

2. The Requirement of Reliability

To authenticate comp-lit evidence under the proposed guidelines, the proponent of the evidence must establish its reliability or accuracy.[28] The *degree* of reliability that must be established should depend upon the type of comp-lit evidence that is proffered.

Courts should require that summaries of business records[29] meet a high standard of reliability. The high standard is necessary because of the nature of a computer-generated summary, and the general provision of Rule 901(a) that evidence must be authenticated by showing that "the matter in question is what its proponent claims."[30] A computer-generated summary of business records states the content of the records.[31] A printout that does not accurately reflect the information that the records con-

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> rather than receiving the evidence upon the basis of an inadequate foundation and placing the burden upon the objector to demonstrate its weakness.

Id. at 895-96 (Ely, J., concurring). For a response to these writers' concerns, see notes 43-49 and accompanying text *infra*.

[25] *See* note 24 *supra*.

[26] *See* text accompanying notes 19 & 20 *supra*.

[27] In cases dealing with the authentication of computer-generated business records, courts require that the authenticating witness be a person who is familiar with the computerized record and the circumstances of its preparation. *See, e.g.,* United States v. Russo, 480 F.2d 1228, 1241 (6th Cir. 1973), *cert. denied,* 414 U.S. 1157 (1974). The same common sense notion should prevail for the authentication of comp-lit evidence. The person most familiar with the preparation of comp-lit evidence will normally be an expert.

[28] *See* FED. R. EVID. 901(b)(9), set forth in note 13 *supra*.

[29] *See* note 9 *supra*.

[30] *See* FED. R. EVID 901(a), set forth in note 12 *supra*.

[31] *See* note 9 *supra*.

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tain does not state their content and is therefore not a summary. Thus, to establish that the proffered evidence is a summary, the litigator must establish that the evidence is highly accurate. In light of Rule 901(a), then, the litigator must establish a high level of accuracy to authenticate the summary. Indeed, one leading case suggests a standard of "utmost accuracy."[32]

In contrast, computer analyses[33] and simulations[34] require a lower standard of reliability. Again, the nature of the evidence influences the standard. In this area, the computer generates the evidence through the use of a model.[35] Evidence so generated is only as accurate as the set of assumptions that comprise the model.[36] Thus, evidence generated by computer analysis or simulation does not purport to be as reliable as a summary.[37] In

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[32] United States v. DeGeorgia, 420 F.2d 889, 895 (9th Cir. 1969) (Ely, J., concurring).

[33] *See* note 10 *supra.*

[34] *See* note 11 *supra.*

[35] *See* note 10 *supra.*

[36] *See generally* C. SIPPL, *supra* note 10, at 481-83.

[37] Because of this lower reliability, some writers advocate a narrow circumscription of the use of analyses and simulations. *See, e.g.*, Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111, 124-26 (2d Cir.) (Van Graafeiland, J., dissenting), *cert. denied*, 429 U.S 987 (1976). Judge Van Graafeiland chided the majority for admitting evidence based upon a computer simulation-model:

> Authorities in the field of computer research acknowledge that simulation is "essentially an experimental problem-solving technique". Gordon, System Simulation 18 (1969). "Simulation is 'make-believe' - it's a game - but it should have some solid relationship with the real world." Favret, Introduction to Digital Computer Applications 122 (1965). It is the "construction and manipulation of a model of a real world reference system by utilizing theoretical simplifications and assumptions", Computer Simulation and Gaming: An Interdisciplinary Survey with a View Toward Legal Applications, 24 Stan. L. Rev. 712 (1972). A computer model is valid "only insofar as it enables us to make valid inferences about the real world system being simulated". Gonzales and McMillan, Machine Computations: An Algorithmic Approach 212 (1971).
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> Plaintiff's expert testified that the computer would not simulate everything that one finds in a vehicle. The District Judge himself stated that it was very obvious that plaintiff's experts did not include all things in the simulation and categorized the testimony of these experts as "an area of pure physics and delightful math". When defense counsel questioned one of the experts about the specific functioning of plaintiff's device, the District Judge said, "He has already testified that he did no experiments directly on the thing. How could he know? He is in the realm of theory."

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light of Rule 901(a), then, the proponent of computer analyses or simulations should not be required to establish as high a degree of reliability.[38]

The lower standard required for analyses and simulations should be specified. Some recent cases suggest a standard of only moderate reliability.[39] A better view favors a variable standard. Under this standard, the proponent should establish that degree of reliability which is consistent with the present state of the art in the modelling technique that is employed.[40]

Perma Research, 542 F.2d at 121-22 (Van Graafeiland, J., dissenting). Judge Van Graafeiland concluded that, since evidence based upon computer models is inherently unreliable, it should not be admitted in the absence of certain safeguards. For a description of these safeguards, see text accompanying note 48 *infra.*

[38] Some writers contend that under Rule 901(b)(9), *see* note 13 *supra,* a single standard of accuracy governs the authentication of any type of comp-lit evidence. *See, e.g.,* Singer, *supra* note 2, at 170-71. This contention is erroneous. The terms of Rule 901(b)(9) must be interpreted in light of the general provision of Rule 901(a), *see* note 12 *supra,* which specifically allows for authentication under varying standards of accuracy. *See* text accompanying notes 30-38 *supra.*

[39] *See* Alabama Power Co. v. Costle, 636 F.2d 323, 385-87 (D.C. Cir. 1979); Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111 (2d Cir.), *cert. denied,* 429 U.S. 987 (1976); Sierra Club v. Environmental Protection Agency, 540 F.2d 1114, 1136 (D.C. Cir.), *cert. denied,* 430 U.S. 959 (1976).

[40] At least one case appears to endorse a variable standard. *See* Alabama Power Co. v. Costle, 636 F.2d 323, 385, 387 (D.C. Cir. 1979).

The need for a variable standard is clear. The degree of reliability that Rule 901(a) requires, *see* note 12 *supra,* is a function of the purported reliability of modelling technique within the relevant discipline. Thus, Rule 901(a) mandates a variable standard, since different disciplines use modelling techniques that differ in their purported reliability. *See generally* R. Dorf, *supra* note 11, at 135-80, 270-96, 327-40 (1974). Employment discrimination, for example, is an area in which computer analysis based upon probability theory has been used successfully to show that in a given labor market a company intentionally discriminated in the hiring of certain groups of people. *See* Dawson, *Probabilities and Prejudice in Establishing Statistical Inferences,* 13 Jurimetrics J. 191 (1973). In contrast, disciplines that use simulation-models to predict the braking distances of automobiles that are equipped with anti-skid devices cannot claim as high a degree of reliability. *See* Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111 (2d Cir.) (Van Graafeiland, J., dissenting), *cert. denied,* 429 U.S. 987 (1976).

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B. Other Foundation Requirements

Rule 901(b)(9)[41] describes one step in laying a foundation for the introduction of comp-lit evidence. The litigator must meet other requirements as well.

1. Advance Notice and Availability of Program

A computer-generated summary,[42] properly authenticated as a highly accurate piece of evidence, may nonetheless present a misleading account of business records.[43] Computer analyses[44] and simulations,[45] properly authenticated as less than completely reliable, may nonetheless be unduly persuasive to factfinders who are awed by computer technology.[46] Therefore, the use of comp-lit evidence may unfairly prejudice an adverse party, and thus be subject to objections under Rule 403.[47]

Courts have established two requirements that address the problem of unfair prejudice created by the use of comp-lit evidence. First, the proponent must give advance notice of the intention to use comp-lit evidence. Second, before trial, the litigator must make available to adversary counsel the details of the computer program that was used to generate the evidence.[48] Ad-

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[41] *See* FED. R. EVID. 901(b)(9), set forth in note 13 *supra*.

[42] *See* note 9 *supra* for a definition of a computer-generated summary.

[43] While the summary accurately reflects the content of the business records selected to be summarized, the portion selected may be incomplete or suggest a conclusion that more comprehensive records would not suggest. This problem is particularly acute when the programmer operates under the litigator's direction, since the litigator's interests will always conflict with the interests of the adverse party. For a good discussion of how this problem surfaces in an actual case, see Sprowl, *supra* note 9, at 563-64.

[44] *See* note 10 *supra* for a definition of computer analyses.

[45] *See* note 11 *supra* for a definition of computer simulations.

[46] For further observations, see Roberts, *supra* note 1, at 256, 279.

[47] Rule 403 states: "Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." FED. R. EVID. 403.

[48] *See, e.g.*, United States v. Cepeda Penes, 577 F.2d 754, 761 (1st Cir. 1978); United States v. Russo, 480 F.2d 1228, 1241 (6th Cir. 1973), *cert. denied*, 414 U.S. 1157 (1974); United States v. Dioguardi, 428 F.2d 1033, 1038 (2d Cir.), *cert. denied*, 400 U.S. 825 (1970). *See also* United States v. Weatherspoon, 581 F.2d 595, 598 (7th Cir. 1978); Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111, 115 (2d Cir.), *cert. denied*, 429 U.S. 987 (1976).

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herence to these requirements will insure that adversary counsel has the opportunity to counteract any prejudicial impact of the comp-lit evidence.[49] Thus, a litigator who complies with these requirements will undercut potential Rule 403 objections.

Often, courts have not enforced these requirements. Appellate courts have granted trial courts broad discretion to determine when a proper foundation requires the pre-trial availability of the computer program. Under certain conditions,[50] especially when the program is uncomplicated,[51] trial courts have normally exercised their discretion by not requiring the availability of the program.

Despite this common exercise of discretion, the proponent of comp-lit evidence should comply with each of the requirements used to diminish prejudice.[52] The proponent does not promote his case by denying access to an uncomplicated program. If the program is uncomplicated, adversary counsel can expose any defects as easily at trial as before trial. Moreover, failure to supply the uncomplicated program to adversary counsel risks the unfavorable exercise of the court's discretion.

2. Summaries and Federal Rule 1006[53]

Courts have uniformly interpreted Rule 1006 to impose a fur-

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[49] Adversary counsel will be able to glean sufficient knowledge from the computer program to determine how the proffered evidence was developed and thus to prepare effective cross-examination.

[50] *See, e.g.,* Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111, 115 (2d Cir.) (court suggested that a programmer's proprietary interests may override the need to make the program available), *cert. denied,* 429 U.S. 987 (1976).

[51] *See, e.g.,* United States v. Cepeda Penes, 577 F.2d 754, 761 (1st Cir. 1978); United States v. Dioguardi, 428 F.2d 1033, 1038 (2d Cir.), *cert. denied,* 400 U.S. 825 (1970). These cases do not clearly define the term "uncomplicated." One court, however, has suggested that a program is sufficiently uncomplicated when the underlying theorems or equations are readily available in standard textbooks. *See* Perma Research and Dev. Co. v. Singer Co., 402 F. Supp. 881, 897 (S.D.N.Y. 1975), *aff'd,* 542 F.2d 111 (2d Cir.), *cert. denied,* 429 U.S. 987 (1976).

[52] *See* text accompanying note 48 *supra.*

[53] Rule 1006 states:

> The contents of voluminous writings, recordings, or photographs which cannot conveniently be examined in court may be presented in the form of a chart, summary, or calculation. The originals, or duplicates, shall be made available for examination or copying, or

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ther foundation requirement for the introduction of a computer-generated summary.[54] The courts have divided, however, on the nature of the requirement. Under one interpretation, the proponent must establish the admissibility of the underlying records that have been summarized.[55] The competing interpretation requires only that the proponent make the underlying records available to adversary counsel.[56]

Although authority is split, the proponent should seek to establish the admissibility of the underlying records as part of an adequate foundation. This foundation will be necessary in any event to provide for the admissibility of the summary over hearsay objections.[57]

II. HEARSAY

Evidence in the form of a computer printout is hearsay both by definition[58] and by judicial mandate.[59] To introduce a

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> both, by other parties at a reasonable time and place. The judge may order that they be produced in court.

FED. R. EVID. 1006.

[54] *See, e.g.,* United States v. Kim, 595 F.2d 755, 764 (D.C. Cir. 1979); United States v. Johnson, 594 F.2d 1253, 1255-57 (9th Cir. 1979); United States v. Smyth, 556 F.2d 1179, 1184-85 (5th Cir.), *cert. denied,* 434 U.S. 862 (1977); United States v. Conlin, 551 F.2d 534, 538 (3d Cir.), *cert. denied,* 434 U.S. 831 (1977), *construed in Johnson,* 594 F.2d at 1256-57; Case and Co. v. Board of Trade, 523 F.2d 355, 361 (7th Cir. 1975); Gordon v. United States, 438 F.2d 858, 876 (5th Cir.), *cert. denied,* 404 U.S. 828 (1971), *construed in Johnson,* 594 F.2d at 1255 n.5.

The judicial view that Rule 1006 imposes a foundation requirement for summaries is somewhat suspect. The rule actually comprises a limit on the Best Evidence Rule, *see* FED. R. EVID. 1002, and thus should apply only when the litigator seeks to prove the contents of a voluminous writing (i.e., that the writing contains particular words). *Cf. Johnson,* 594 F.2d at 1255. Typically, summaries are used to prove a writing's veracity, not its contents.

[55] *See* United States v. Johnson, 594 F.2d 1253, 1255-57 (9th Cir. 1977); Gordon v. United States, 438 F.2d 858, 876 (5th Cir.), *cert. denied,* 404 U.S. 828 (1971), *construed in Johnson,* 594 F.2d at 1255 n.5.

[56] *See* United States v. Kim, 595 F.2d 755, 764 (D.C. Cir. 1979); United States v. Smyth, 556 F.2d 1179, 1184-85 (5th Cir.), *cert. denied,* 434 U.S. 862 (1977); Case and Co. v. Board of Trade, 523 F.2d 355, 361 (7th Cir. 1975). *See also* 4 J. WIGMORE, EVIDENCE IN TRIALS AT COMMON LAW § 1250 (3d ed. 1972).

[57] *See* note 70 *infra.*

[58] Rule 801(c) defines "hearsay" as "a statement other than one made by the declarant while testifying at the trial or hearing . . . ." FED. R. EVID. 801(c).

[59] *See* United States v. Ruffin, 575 F.2d 346, 356 (2d Cir. 1978).

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printout into evidence, then, the proponent must invoke a recognized exception to the hearsay rule.[60] Two exceptions may overcome a hearsay objection.

A. The Business Records Exception

Under the business records exception, evidence generated by computer in the regular course of business is admissible over hearsay objections.[61] Since comp-lit evidence is generated for purposes of litigation, the exception appears inapplicable.[62] Nonetheless, the proponent of a summary should be able to use this exception in two situations.

One situation occurs when a business has entered its records into a computer through a procedure that predetermines the content of subsequently retrieved summaries.[63] When a prede-

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[60] Rule 802 states: "Hearsay is not admissible except as provided by these rules or by other rules prescribed by the Supreme Court pursuant to statutory authority or by Acts of Congress." FED. R. EVID. 802.

[61] Rule 803(6) excepts:

> A memorandum report, record, or data compilation, in any form, of acts, events, conditions, opinions, or diagnoses, made at or near the time by, or from information transmitted by, a person with knowledge, if kept in the course of a regularly conducted business activity, and if it was the regular practice of that business activity to make the memorandum, report, record, or data compilation, all as shown by the testimony of the custodian or other qualified witness, unless the source of information or the method or circumstances of preparation indicate lack of trustworthiness.

FED. R. EVID. 803(6). The drafters intended the phrase "data compilations" to cover the product of electronic computer storage and thus a computer printout. *See* Advisory Committee's Note to Rule 803(6), 56 F.R.D. 183, 311 (1972). *See also* Rosenberg v. Collins, 624 F.2d 659, 665 (5th Cir. 1980); United States v. Scholle, 553 F.2d 1109, 1124 (8th Cir.), *cert. denied,* 434 U.S. 940 (1977).

[62] The rationale underlying the business records exception is that records generated and relied upon in the ordinary course of business are inherently reliable. *See* United States v. Kim, 595 F.2d 755, 761 (D.C. Cir. 1979); Advisory Committee's Note to Rule 803(6), 56 F.R.D. 183, 308 (1972). *See also* Hiram Ricker and Sons v. Students Int'l Meditation Soc'y, 501 F.2d 550, 554 (1st Cir. 1974). Documents that are used primarily for litigation purposes, however, lack this inherent reliability. *See* Palmer v. Hoffman, 318 U.S. 109 (1943); C. J. Clark v. City of Los Angeles, 650 F.2d 1033 (9th Cir. 1981); United States v. Smith, 521 F.2d 957 (D.C. Cir. 1975); Cunningham v. Gans, 507 F.2d 496 (2d Cir. 1974).

[63] The input procedure for recording routine business transactions may provide for a selective retrieval capability. This occurs when the input procedure codes each piece of input data. The code assures that without subsequent pro-

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termined summary is retrieved, even though for purposes of litigation,[64] it should be accorded the status of a business record and thus be admissible under the business records exception.[65]

The second situation for the use of the business records exception arises when the litigator appropriates Rule 1006 for hearsay purposes.[66] Under this rule, the litigator can establish the admissibility of a summary over hearsay objections without showing that the summary qualifies under a hearsay exception. The litigator need only establish that the records underlying the summary qualify for the business records exception.[67]

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gramming, data can be retrieved and presented in a particular format. Naturally, the coding procedure is designed to accommodate anticipated business needs. *See generally* P. ABRAMS & W. CORVINE, BASIC DATA PROCESSING 71-74 (1971); E. AWAD, *supra* note 19, at 37-44, 292-94.

United States v. Russo, 480 F.2d 1228 (6th Cir. 1973), *cert. denied,* 414 U.S. 1157 (1974), illustrates the use of a selective retrieval capability in anticipation of business needs. Blue Shield regularly input the contents of Doctor's Service Reports under coding instructions which determined that the data could later be retrieved as rearranged to indicate the frequency of particular medical procedures. Classification of the data in this way facilitated Blue Shield's subsequent annual statistical run. *Russo,* 480 F.2d 1228.

[64] Although the evidence is originally conceived for business purposes, it represents a type of comp-lit evidence. *See* note 16 *supra.*

[65] *See* United States v. Russo, 480 F.2d 1228, 1239-40 (6th Cir. 1973) (court admitted summary generated pursuant to selective retrieval procedures as an "original record"), *cert. denied,* 414 U.S. 1157 (1974). While *Russo* is the only case that adopts this view, reason and a lack of authority to the contrary dictate that the view should prevail. The purpose of conceiving summaries via a selective retrieval capability is to assure the ready availability of information needed to conduct the business. Thus, these summaries, although retrieved solely for purposes of litigation, contain information upon which the business intends to rely. Such reliance is the basis of the presumption of reliability that justifies the business records exception. *See* note 62 *supra.*

Some courts suggest that summaries retrieved for litigation purposes are admissible under the business records exception as long as the underlying records are entered into the computer in the regular course of business. *See* Transport Indem. Co. v. Seib, 178 Neb. 253, 132 N.W.2d 871 (1965); City of Seattle v. Heath, 10 Wash. App. 949, 520 P.2d 1392 (1974). However, this view is weak. Unless input procedures create a selective retrieval capability, the fact that entries are made in the regular course of business does not insure that the business intended to rely upon the specific content of summaries subsequently retrieved. The litigator can design a retrieval program to select portions of the records that serve the interests of litigation rather than those of the business.

[66] *See* FED. R. EVID. 1006, set forth in note 53 *supra.*

[67] *See* United States v. Johnson, 594 F.2d 1253, 1255-57 (9th Cir. 1979). While *Johnson* is the only case applying Rule 1006 in this way, the application

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The litigator must recognize the appropriate times to use either of these two applications of the business records exception. The first application is appropriate only when the business has used specific input procedures[68] and the litigator's strategic concerns do not require that he influence the summary's content.[69] The second use, on the other hand, is suited to any instance in which the litigator seeks the admission of a summary.[70]

B. *The Residual Exception*

The residual exception governs the admissibility of hearsay evidence that fails to meet the requirements of any other exception.[71] Whether the exception will allow admission of comp-lit

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is appropriate in light of the authentication guidelines proposed earlier. *See* text accompanying notes 19, 20, 28 & 32 *supra*. Authentication of a summary under these guidelines establishes that the summary accurately reflects the contents of the underlying summarized records. Thus, once the litigator establishes that the contents of the underlying records warrant qualification under the business records exception, a separate showing for the summary should be unnecessary.

[68] *See* note 63 and accompanying text *supra* for a description of the specific procedures. Since businesses that use electronic data processing frequently use these procedures, *see* E. AWAD, supra note 19, at 37-46, this limitation is not severe.

[69] *See* note 65 *supra*.

[70] The preceding considerations, *see* text accompanying notes 61-67 *supra*, support the earlier conclusion that an adequate foundation for the introduction of a summary includes establishing the admissibility of the underlying records. *See* text accompanying note 57 *supra*. The litigator who exploits Rule 1006 must establish the admissibility of the underlying records through the business records exception. On the other hand, the litigator who wants to establish that a summary is the product of a selective retrieval capability must show that the summary contains information relied upon in the ordinary course of business. This requires showing that the underlying records are relied upon in the ordinary course of business and thus are admissible under the business records exception.

[71] Rule 803(24) excepts:

> A statement not specifically covered by any of the foregoing exceptions but having equivalent circumstantial guarantees of trustworthiness, if the court determines that (A) the statement is offered as evidence of a material fact; (B) the statement is more probative on the point for which it is offered than any other evidence which the proponent can procure through reasonable efforts; and (C) the general purposes of these rules and the interests of justice will best be served by admission of the statement into evidence. However, a statement may not be admitted under this exception unless the

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evidence depends upon the type of such evidence proffered and which of two judicial views of the exception prevails.

To get evidence admitted under the residual exception, the proponent must establish that the proffered evidence has substantial guarantees of reliability.[72] Since computer analyses and simulations are not entirely reliable, they fail to meet this requirement.[73] Computer-generated summaries, however, are sufficiently reliable to meet this requirement.[74] To show that a summary meets the reliability requirement, the proponent need only authenticate the summary under the proposed guidelines.[75]

However, to qualify under the residual exception a computer-generated summary must also fall within the intended scope of the exception. The majority of courts so constrict its scope as to discourage its application to comp-lit evidence. Under the majority interpretation of the legislative history,[76] the exception may be applied only in rare and exceptional circumstances.[77] However, a more expansive, minority interpretation allows any novel or unanticipated evidentiary situation to fall within the scope of the exception.[78] Since the federal hearsay exceptions do not refer to comp-lit evidence, situations in which a proponent seeks its admission over a hearsay objection should be regarded as unanticipated.[79] Thus, the minority interpretation of the ex-

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> proponent of it makes known to the adverse party sufficiently in advance of the trial or hearing to provide the adverse party with a fair opportunity to prepare to meet it, his intention to offer the statement and the particulars of it, including the name and address of the declarant.

FED. R. EVID. 803(24).

[72] *See* Advisory Committee's Note to 803(24), 56 F.R.D. 183, 320 (1972).

[73] *See* text accompanying notes 35-37 *supra*.

[74] *See* text accompanying notes 31 & 32 *supra*.

[75] *See* text accompanying notes 19, 20, 28 & 32 *supra*.

[76] *See* COMMITTEE ON THE JUDICIARY, S. REP. No. 93-1277, 93d CONG., 2d Sess. 19-20, *reprinted in* 1974 U.S. CODE CONG. & AD. NEWS 7051, 7051-66; Advisory Committee's Note to 803(24), 56 F.R.D. 183, 320 (1972).

[77] *See, e.g.*, United States v. White, 611 F.2d 531, 538 (5th Cir. 1980); Huff v. White Motor, 609 F.2d 286, 291 (7th Cir. 1979); United States v. Kim, 595 F.2d 755, 765 (D.C. Cir. 1979); United States v. Mandel, 591 F.2d 1347, 1368 (4th Cir. 1979); United States v. Cain, 587 F.2d 678, 681-82 (5th Cir. 1979); United States v. Oates, 560 F.2d 45, 72-73 n.30 (2d Cir. 1977).

[78] *See* United States v. Mathis, 559 F.2d 294, 299 (5th Cir. 1977); United States v. A.T.&T., 516 F. Supp. 1237, 1240 (D.D.C. 1981).

[79] FED. R. EVID. 803(6), set forth in note 61 *supra*, refers to data compilations, which include computer-generated evidence. *See* Advisory Committee's

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ception would allow the admission of a computer-generated summary. The litigator should therefore exploit the residual exception in appropriate jurisdictions.

III. Expert Witness Testimony

Discussion to this point has addressed problems in admitting a computer printout into evidence. A printout that states a summary of business records may be admissible over hearsay objections.[80] However, a printout that states the results of analyses or simulations is not so admissible.[81] If the litigator wishes to use either a computer analysis or simulation, Rule 703[82] dictates its use only as a basis for expert testimony. Rule 703 allows an expert witness' testimony to be based upon facts and data that "need not be admissible in evidence."[83] Thus, the litigator need not qualify the basis of expert testimony under a hearsay exception.

The phrase "need not be admissible in evidence"[84] suggests further that the litigator need not lay a foundation for an analysis or simulation that provides the basis of expert testimony. This suggestion is misleading. The litigator must still authenticate any analysis or simulation under the guidelines proposed earlier,[85] since Rule 703 requires that the facts or data underlying the expert testimony be "of a type reasonably relied upon by experts in the particular field."[86] Experts in the computer field reasonably rely upon analyses and simulations as long as the

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Note to Rule 803(6), 56 F.R.D. 183, 311 (1972). But as the rule uses the phrase, "data compilations" encompass only computer-generated evidence that is conceived and retrieved in the ordinary course of business. *Id.* The phrase thus does not contemplate comp-lit evidence.

[80] *See* notes 58-79 and accompanying text *supra.*

[81] *See* notes 61-79 and accompanying text *supra.*

[82] Rule 703 states:

> The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to him at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.

Fed. R. Evid. 703.

[83] *Id.*

[84] *Id.*

[85] *See* text accompanying notes 19, 20, 28 & 40 *supra.*

[86] *See* Fed. R. Evid. 703, set forth in note 82 *supra.*

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limitations that are inherent in the underlying modelling techniques are acknowledged.[87] To establish that a particular analysis or simulation is of the requisite type, then, the litigator must show that it *is* an analysis or simulation and that it has a degree of reliability that is consistent with the state of the art in the modelling technique employed. These requirements precisely track the proposed authentication guidelines.[88] Therefore, the litigator must follow these guidelines in order to comply with Rule 703.

While Rule 703 especially aids the proponent of an analysis or simulation, the litigator may also choose to present the contents of a summary through expert testimony. Again, the rule requires that the litigator follow the proposed authentication guidelines.[89]

It is unclear whether the litigator must also follow the foundation requirements of advance notice and availability.[90] Rule 705 allows the litigator to use computer-generated materials as a basis for expert testimony without making the underlying materials available before trial.[91] However, some courts have indicated that the litigator should give advance notice of intent to use these materials and make them available to adversary counsel before trial.[92] Despite Rule 705, the litigator should follow the direction of these courts and adhere to these other foundation requirements. Computer-generated materials may have prejudicial impact whether they are presented in the form of a printout or used as a basis of expert testimony.[93] The litigator's compliance with the literal terms of Rule 705 does not foreclose objec-

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[87] *See* notes 37-40 and accompanying text *supra.*

[88] *See* text accompanying notes 19, 20, 28 & 40 *supra.*

[89] To establish that it is reasonable to rely upon a summary is simply to authenticate it as a summary. *See* text accompanying notes 19, 20, 28, 31 & 32 *supra.*

[90] *See* text accompanying note 48 *supra.*

[91] Rule 705 states: "The expert may testify in terms of opinion or inference and give his reasons therefor without prior disclosure of the underlying facts or data, unless the court requires otherwise. The expert may in any event be required to disclose the underlying facts or data on cross-examination." FED. R. EVID. 705.

[92] *See* Perma Research and Dev. Co. v. Singer Co., 542 F.2d 111, 115 (2d Cir.), *cert. denied,* 429 U.S. 987 (1976); United States v. Dioguardi, 428 F.2d 1033, 1038 (2d Cir.), *cert. denied,* 400 U.S. 825 (1970).

[93] For discussion of the prejudicial impact of comp-lit evidence, see notes 43 & 46 and accompanying text *supra.*

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tions based on prejudice.[94] However, the litigator who follows the foundation requirements of advance notice and availability will counteract any prejudicial impact of comp-lit testimony.[95] The litigator thus will undercut potential Rule 403 objections.[96]

CONCLUSION

Despite the relative novelty of comp-lit evidence, Congress and courts have developed a legal apparatus that will accommodate its use in litigation. Without actually so intending, courts have provided appropriate guidelines for authenticating comp-lit evidence under the Federal Rules of Evidence.[97] Moreover, while the hearsay nature of comp-lit evidence generally remains a barrier to its admissibility,[98] provisions of the Federal Rules allow for its effective use as a basis for expert testimony.[99]

Existing law also provides for the *fair* use of comp-lit evidence in litigaton.[100] In fact, its use harbors less potential for prejudice than does the use of computer-generated business records. Unlike authentication of business records, authentication of comp-lit evidence requires an affirmative showing that the proffered evidence was generated in adherence to a broad range of procedural safeguards.[101]

Of course, these safeguards cannot prevent the prejudicial use of comp-lit evidence.[102] However, prejudice can only result from a lax adversary counsel or a court that does not enforce the foundation requirements of advance notice and availability.[103] Indeed, courts tend not to enforce these requirements.[104] In

[94] Rule 705, set forth in note 91 *supra*, assumes that there has been adequate pre-trial discovery for the opponent of the evidence to prepare effective cross-examination. *See* Smith v. Ford Motor Co., 626 F.2d 784, 791-94 (10th Cir. 1980), *cert. denied*, 450 U.S. 918 (1981). When adequate discovery has not occurred, then the assumptions underlying Rule 705 are invalid and the rule is inoperative. *Smith*, 626 F.2d at 791-94.

[95] *Cf.* note 49 and accompanying text *supra*.

[96] *See* FED. R. EVID. 403, set forth in note 47 *supra*.

[97] *See* notes 15-27 and accompanying text *supra*.

[98] *See* notes 58-79 and accompanying text *supra*.

[99] *See* notes 80-96 and accompanying text *supra*.

[100] *Cf.* notes 42-52 and accompanying text *supra* for a discussion of possible sources of prejudice in the use of comp-lit evidence.

[101] *See* notes 19, 20, 23 & 24 and accompanying text *supra*.

[102] *See* notes 43-47 and accompanying text *supra*.

[103] *See* notes 48 & 49 and accompanying text *supra*.

[104] *See* notes 50 & 51 and accompanying text *supra*.

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some cases, this lack of enforcement stems from a reliance on discovery practice.[105] However, the failure to require advance notice and availability usually reflects a court's perception of the degree of complexity of the evidence.[106] When that perception is inaccurate, prejudice may result.

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[105] *See, e.g.*, United States v. Liebert, 519 F.2d 542, 549-51 (3d Cir. 1975) (defendant had ample opportunity through discovery to prepare for cross-examination of government's computer experts).

[106] *See* note 51 and accompanying text *supra*.

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